ART. XVIII.—*A Universal Equatorial and an Instrument for Facilitating the Observation of Mars.*

By T. HARRISON, ESQ.

[Read 6th September, 1875.]

ART. XIX.—*The Arithmometer.*

By W. C. KERNOT, ESQ., M.A.

[Read 6th September, 1875.]

The machine to which I propose to invite your attention this evening is the invention of M. Thomas de Colmar, and is termed by him the Arithmometer, or number measurer. It was first patented in 1820. In 1822 the inventor exhibited it to the Société d'Encouragement pour l'Industrie Nationale. In 1851 the gold medal of that society was awarded to the inventor, and one of the instruments was exhibited at the Great Exhibition at London of that year ; but, as far as I can judge from the published records of that exhibition, does not appear to have been so complete as those of more recent construction. The first machine that reached this colony, as far as I am aware, was imported by J. M. Templeton, Esq., F.I.A., about three years ago. On inspecting Mr. Templeton's machine I became convinced of its utility, and immediately ordered one, which you now see before you. This instrument I have had in constant use for more than two years, with the most satisfactory results.

The diagram accompanying this paper represents the upper surface or " face " of the instrument, which consists of two plates of brass, AA and BB. The plate A, which is permanently fixed, is pierced by a series of slots, in each of which is placed a metal button capable of motion from one end of the slot to the other. At the side of each slot the numbers 1 to 9 are engraved on the plate. Immediately beneath each slot there is a square horizontal steel axis, upon which a pinion of ten teeth is capable of sliding longitudinally. This pinion is connected with the button, so that its position on its axis will vary when the button is moved. Below the pinion there is a drum or cylinder, having nine teeth of successively diminishing length, so